REMARKS

Applicants request favorable reconsideration and allowance of the present application in view of the foregoing amendments and the following remarks.

Claims 9, 10, 12-21, 23-28, 41-42, 45-53, and 56-61 are pending. Claims 9, 20, 41, 52, and 61 are the independent claims.

Claims 9, 20, 41, 52, and 61 have been amended. No new matter is believed to have been added. Claims 11, 22, 43, and 54 have been cancelled without prejudice or disclaimer.

Claims 9-28, 41-43, 45-54, and 56-61 stand rejected under 35 U.S.C. §103(a) as being obvious over U.S. Patent No. 6,118,586 to Tanabe et al. in view of Japanese Utility Model No. 258847 by Landis, and further in view of U.S. Patent No. 6,088,076 to Ogawa et al. All rejections are respectfully traversed.

Independent claims 9 and 20 recite, *inter alia*, "each cell comprising blazed type or binary type curved gratings having the same profile and arranged in parallel".

Independent claims 41 and 52 recite, *inter alia*, "each cell comprising curved gratings having the same profile and arranged in parallel".

Independent claim 61 recites, *inter alia*, "each of the diffraction grating cells including at least one of a blazed type and a binary type grating have the same profile and arranged in parallel".

Applicants respectfully submit that none of the asserted citations teaches or suggests at least the aforementioned features of independent claims 9, 20, 41, 52, and 61. Thus, without conceding the propriety of the combination, the asserted combination is likewise deficient.

The Office Action contends that Tanabe et al. teaches that the gratings of different grating cells contain the same profile and are arranged in parallel with each other at col. 5, lines 30-34. Applicants respectfully submit, however, that Tanabe et al. merely teaches that polarization directions cross as between the going direction of light (the direction from the light source side to the optical recording medium side) and the returning direction of light (the direction from the optical recording medium side to the light source side), and the phase difference element functions as an optically anisotropic diffraction grating. Accordingly, Applicants respectfully submit that Tanabe et al. fails to teach or suggest that the cell is formed of diffraction gratings having the same profile and arranged in parallel.

Further, Tanabe et al. discusses a diffracting element having lattice-like projections and

recesses. Tanabe et al. at col. 3, line 35; col. 4, line 59; col. 6, line 10; col. 10, line 55. The lattice of Tanabe et al. is formed of linear patterns and, thus, does not teach or suggest a cell formed of diffraction gratings having the same profile and arranged in parallel, as recited in the independent claims.

In a non-limiting example, according to the present invention, each diffraction grating cell has a plurality of curved diffraction gratings (12, 22) and is adapted to diffuse light by means of a diffraction effect. Specification at page 13, lines 16-18. Curved diffraction gratings are used for the purpose of controlling the view area by scattering light. Specification at page 13, line 26 to page 14, line 1.

When irradiated with white light, diffraction gratings produce a spectrum of diffracted light like a rainbow because the diffraction angle varies as a function of wavelength. In other words, the colors of light from the optical diffusion film are dispersed and when they are recognized differently by each eye of the viewer, the viewer will have a strange feeling and easily become tired of seeing them. In the case of a display device for utilizing environmental light, the strongest component of light generally comes from above. Therefore, in the case of a reflection type display device, the dispersion of colors may not be recognized differently by two eyes of the viewer when the display device is irradiated with light coming obliquely from above if the diffraction gratings show a relationship as described below. Specification at page 15, line 25 to page 16, line 13.

As described at page 16, line 14 to page 18, line 25 of the Specification, the diffraction gratings are formed by arranging identical curved lines (in the form of a sector of a circle in FIG. 2) in parallel, as shown in FIG. 2. FIG. 3 is an enlarged and detailed illustration of a single diffraction grating cell of FIG. 2 with a more enlarged partial view (a part surrounded by a circle on the right side). The curved lines are separated at regular intervals of d in a given area and the interval d has a horizontal component d_x and a vertical component d_y.

Assume that white light is made to strike the diffraction grating cell (the reflection type diffraction grating cell (the reflection type diffraction grating cell) from above at an angle of θ (a line normal to the drawing has an angle of 0). When diffracted light having a wavelength λ goes out at an angle a_x relative to the horizontal direction (from left to right) and angle a_y relative to the vertical direction (from above to below), theoretically, the following relations hold true.
$\lambda=d_x*\sin a_x$ (1) and $\lambda=d_y(\sin ?+\sin a_y)$.

From these relationships, light with a wavelength λ goes out at a constant angle equal to

the angular component a_y in the vertical direction if all the vertical intervals d_y of the gratings are held to a constant value. Therefore, light going out from the diffraction grating cell constantly shows the same vertical angle regardless of the horizontal position if all the vertical intervals d_y of the gratings are held to a constant value. Thus, the colors are held invariable in the horizontal direction, and the same color is recognized by both eyes of the viewer.

In order to make the interval d_y between a grating and an adjacent grating show a constant value in the vertical direction to be equal in any area, the two gratings need to have the same and identical profile and be arranged in parallel with each other.

When two gratings having the same and identical profiles are separated from each other by a constant interval d_y in the y-direction, the interval separating them in the x-direction changes gradually at any point on the gratings and hence the angular component a_x in the horizontal direction also changes gradually at any point on the gratings. Therefore, it is possible to obtain diffracted light distributed only in the horizontal direction with a constant height in the vertical direction (diffraction angle a_x) for light having a given wavelength. In other words, it is easily possible to emit diffracted light extending linearly in the horizontal direction that is perpendicular to the direction of juxtaposition of the gratings.

It is possible to obtain an optical diffusion film that shows little change of color of diffracted light in the horizontal direction by applying this relationship to all the gratings of a diffraction grating cell. Since an optical diffusion film comprising such diffraction grating cells shows little change of color in the horizontal direction, any color will not be recognized differently by the eyes of the viewer so that the viewer will be able to see the image without any strange feeling and, hence, will not become tired of seeing it. Additionally, since diffracted light provides a spectrum like a rainbow whose color changes in the vertical direction, it is possible to show a dynamic image having a high eye-catching effect.

Landis describes a diffraction grating pattern of 0 to 300 μm to provide microcharacters having desired properties including anti-counterfeiting means. Ogawa et al. describes a liquid crystal display apparatus using a holographic optical element. Applicants respectfully submit that neither Landis nor Ogawa et al. adds anything to the teachings or suggestions of Tanabe et al. that remedies the aforementioned deficiencies.

Accordingly, favorable reconsideration and withdrawal of the rejection of independent claims 9, 20, 41, 52, and 61 under 35 U.S.C. §103 are respectfully requested.

In view of the foregoing, Applicants respectfully submit that the independent claims

patentably define the present invention over the citations of record. Further, the dependent claims should also be allowable for the same reasons as their respective base claims and further due to the additional features that they recite. Separate and individual consideration of the dependent claims is respectfully requested.

Applicants believe that the present Amendment is responsive to each of the points raised by the Examiner in the Official Action. However, if there are any formal matters remaining after this response, the Examiner is requested to telephone the undersigned to attend to such matters.

There being no further outstanding objections or rejections, it is submitted that the present application is in condition for allowance. An early action to that effect is courteously solicited.

If there are any additional fees associated with filing of this Amendment, please charge the same to our Deposit Account No. 19-3935.

Respectfully submitted,

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